

The black band at the top of Figure 7 was to be removed. The lettering was to be made darker.

The shading in the band and background in Figure 8 was to be removed. The lettering was to be made darker.

5           Figures 9a to 9c were to be separated by at least one-half inch. A Figure 9 title was to be added. Figures 9a to 9c titles could remain as drawn. The background shading in Figure 9 was to be removed. Graph lines in Figures 9a and 9c were to be made bolder.

10           Figure 10 was to be corrected the same as Figure 9 above.

Figure 10a was to be separated from Figure 10b by at least one-half inch and the graph and frame lines were to be made darker.

15           While the last office action did not object to Figure 12 it is similar to Figure 10. Accordingly, the applicants' patent draftsman has redrawn Figure 12 and has included it in this amendment.

20           The Examiner questioned whether a 35 U.S.C. 312 amendment to the specification would be necessary to make reference to Figures 9 and 10 as now titled.

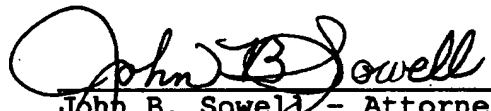
25           It is respectfully submitted that reference is already made to Figures 9 and 10 in the specification as witnessed by a copy of page 3 of the specification enclosed as Exhibit A.

30           It is respectfully submitted that the drawing objections raised in paper No. 18 were in most part different from those raised in paper No. 6. The requirements set forth in paper No. 18 could only be cured by newly drawn formal drawings whereas the objections set forth in paper No. 6 could be cured by amending the pending formal drawings which was done.

A copy of Figures 9 and 10 marked in red ink are attached showing the amended matter.

This application was amended before the issued fee was paid. The additional requirements could only be made  
5 after receiving paper No. 18 and should be entered before the application is sent to printing.

Respectfully submitted,

  
John B. Sowell - Attorney  
Registration No. 19,151

Enclosure (3)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on 21 OCT 2002  
(Date of Deposit)

JOHN B. SOWELL - ATT  
(Name of Applicant, Assignee, or Registered Representative)

  
Signature

21 OCT 2002  
Date of Signature



Fig. 1 is a block diagram of the laser marking apparatus;

Fig. 2a is a more detailed block diagram of the beam conditioning module of the laser marking apparatus;

Fig. 2b is a preferred embodiment of the beam conditioning module;

Fig. 3 is a more detailed diagram of the laser marking apparatus incorporating a processor;

Figs. 4 shows the front and side views of the laser marking apparatus;

Fig. 5 is a typical cross section of a finished disk;

Fig. 6 is a scanning electron microscopy image of the laser marks formed on the disk surface by a scanning pulsed laser beam;

Fig. 7 shows characters formed on the hard disk surface using the laser marking system;

Fig. 8 depicts laser marking on a hard disk surface without a lubricating layer;

Figs. 9a, 9b and 9c are data profile plots corresponding to cross-sections of an atomic force microscopy image of the ripple structure shown in Fig. 9 formed during laser marking according to the present invention;

Figs. 10a, 10b, and 10c are data profile plots corresponding to cross-sections of an atomic force microscopy image of the ripple structure shown in Fig. 10 formed during laser marking using a laser fluence above that of the present invention;

Fig. 11a is an auger electron spectroscopy depth profiling performed on the ripple structure of Fig. 9, and Fig. 11b is an auger electron spectroscopy depth profiling performed on a non-irradiated region on the same disk specimen;

Fig. 12 is an atomic force microscopy image of a mark made on a hard disk using a fluence above the range of the present invention;

Fig. 13 are data plots showing the results of auger electron spectroscopy performed on the surface of Fig. 12 at three locations, namely a - the center of the ripple structure, b - the rippling region and c - a non-irradiated region; and

Fig. 14 illustrates auger electron spectroscopy data profiles of scans performed at various depths of the central portion of the ripple structure of Fig. 9 showing that the surface carbon layer remains intact;

Fig. 15 is an enlarged version of Fig. 9.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

A laser marking process performed on hard disks can produce two kinds of surface deformation. Commonly, the process results in severe melting and inter-diffusion of the upper metallic layers. As the protective carbon layer has also been

EXHIBT A



332,756

JC

approved  
JD  
11/20/02

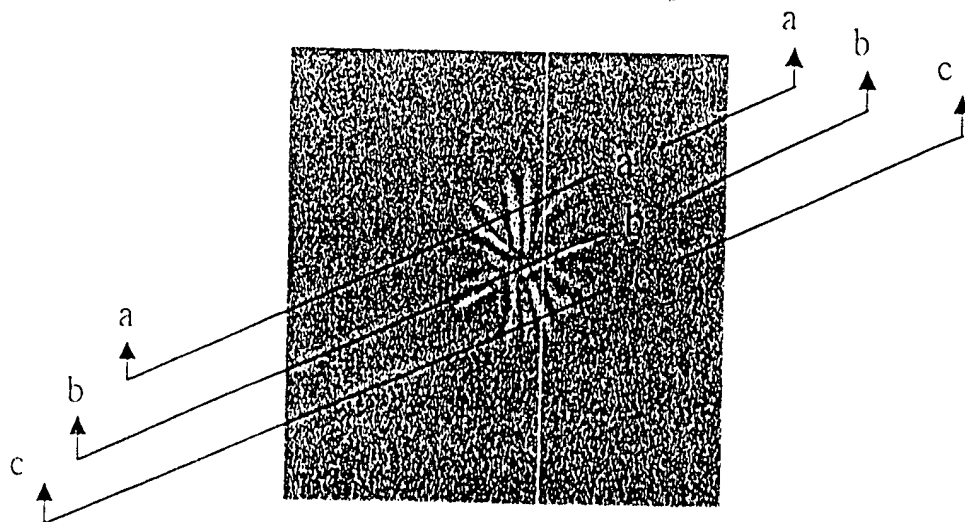


Fig. 9

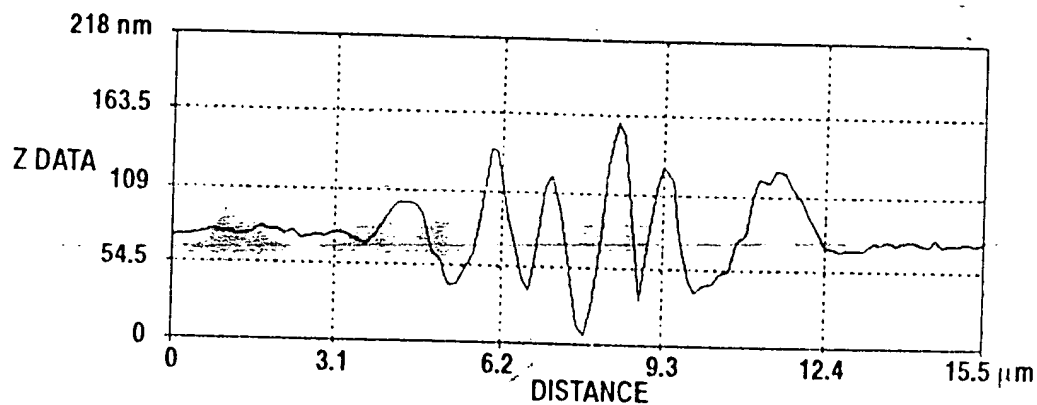


Fig. 9a

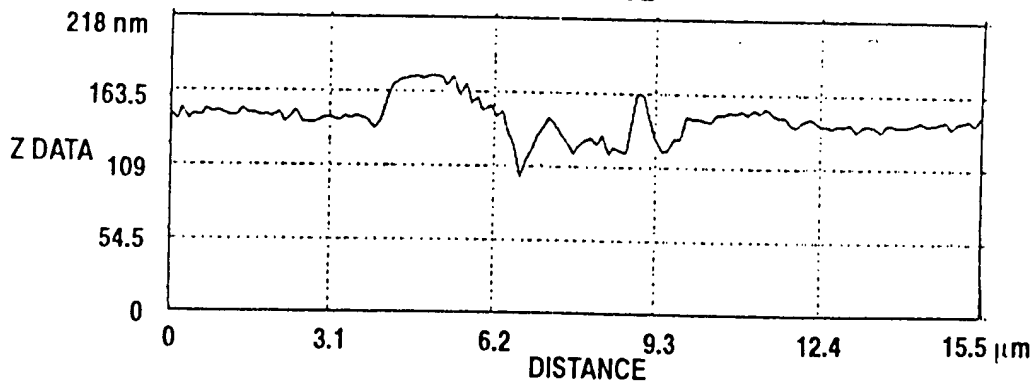


Fig. 9b

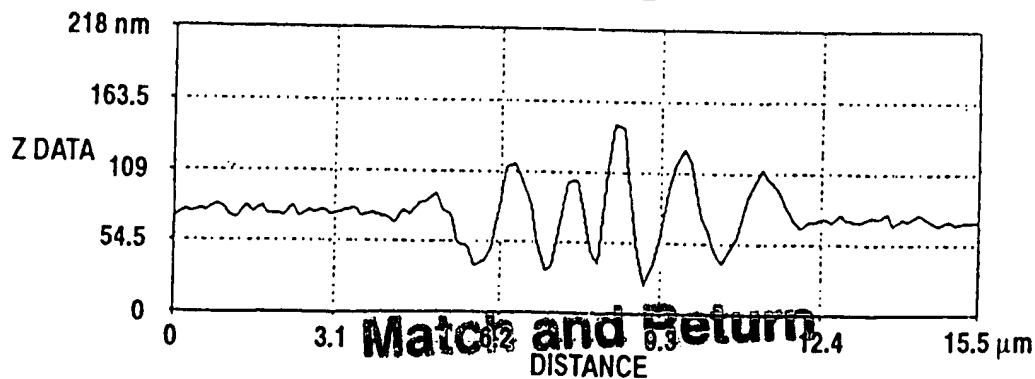


Fig. 9c

Match and Return

06-02

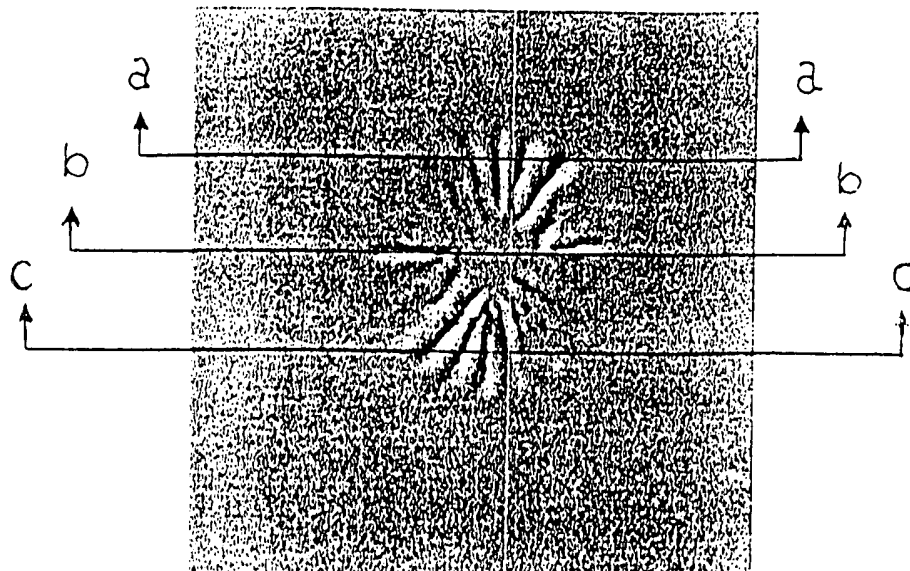


Fig 10

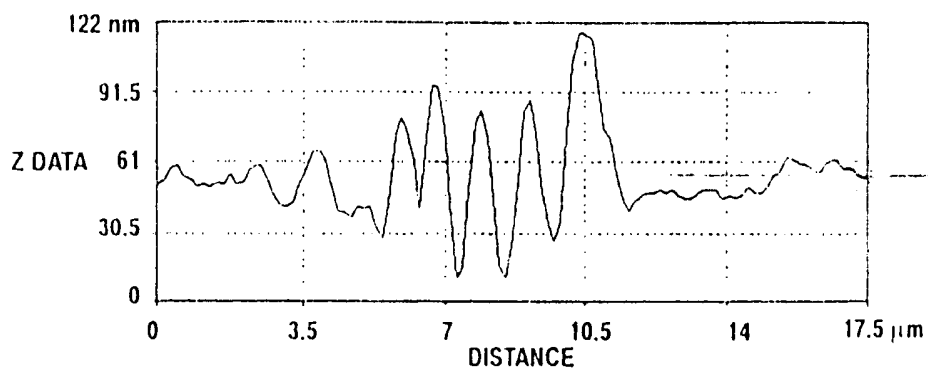


Fig. 10a

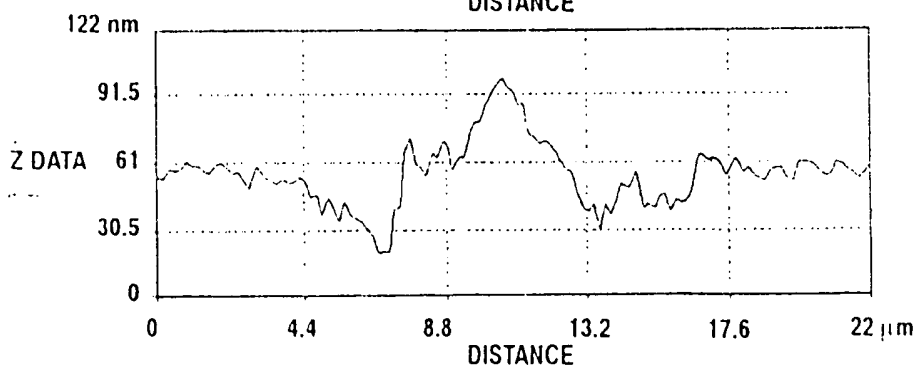


Fig. 10b

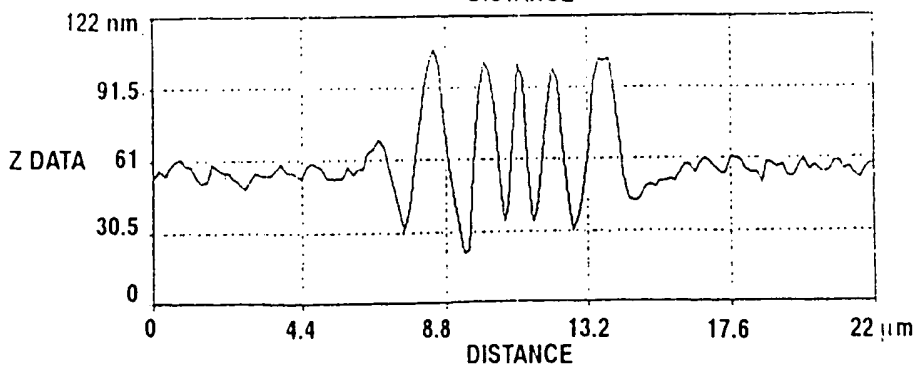


Fig. 10c